

## A New Species of *Coloradia* in California (Saturniidae, Hemileucinae)

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**Abstract.** *Coloradia velda*, sp. nov., is shown to be an undescribed species inhabiting the San Bernardino Mountains, San Bernardino County, California, based upon a series of 50 specimens. These were compared with specimens of *Coloradia pandora lindseyi* and *Coloradia pandora davisii*, *Coloradia doris*, *Coloradia luski*, and *Coloradia euphrosyne*. The genitalia of *Coloradia velda* are unique in their structure among the five known species of *Coloradia* in North America. Its genitalia were compared with specimens of genitalia from *Coloradia doris* and *Coloradia luski*, and with the genitalia figures of *Coloradia pandora* subspecies, and that of *Coloradia euphrosyne* figured by Ferguson, 1971. The moth flies generally through the pine woodlands above 1400 meters late at night in June, with greatest abundance in pure stand Pinyon Pine woodland of *Pinus monophylla*.

### Introduction

For a number of years, mostly in June, we have taken specimens of a *Coloradia* in the San Bernardino Mountains, San Bernardino County, California. Ferguson (1971) figures a specimen on Plate 11, Figure 8, taken by Grace and John Sperry at Barton Flats, June 1, 1946. Mr. Lance Dunmire, a former student of Johnson, took one male in 1971 at Seven Oaks, as has Erich Walter. Erich Walter took his first specimen at Crab Creek crossing near Crab Flat Forest Service Campground on the night of July 27, 1963. Later, Walter, accompanied by Mr. Kenneth Denton of Laguna Beach, found the species at Coxie Meadow. The authors have collected additional specimens at Horse Spring Campground. Mr. Charles Bellamy took a female at Cactus Flat along Highway 18, and Robert Velten took a male at Barton Flats Forest Service Campground. It is evident that the species has a wide distribution through the San Bernardino Range.

The writers have compared these specimens with a male *Coloradia doris* Barnes (1900) taken at light June 24, 1968, and two male *Coloradia luski* Barnes and Benjamin (1926) taken at light June 24, 1968, and July 4, 1969, by John R. Johnson, at Indian Writings Camp

in North Ponil Canyon of the Philmont Scout Ranch in the Sangre de Cristo Mountains at an elevation of 2000 meters and sixteen kilometers northwest of Cimarron, Colfax County, New Mexico. Genitalia were prepared from one specimen of each of these species for comparison with the San Bernardino taxon. The San Bernardino specimens also were compared with specimens *Coloradia pandora lindseyi* Barnes and Benjamin (1926), *Coloradia davisi* Barnes and Benjamin (1926), and *Coloradia euphrosyne* Dyar (1912), as well as with the figures of *Coloradia* species provided by Ferguson (1971), and with his description of the type of *C. euphrosyne* as well as with that of Dyar's original description. It is very evident that the San Bernardino taxon is unique both in appearance and in its genitalia in comparison with all other known species of *Coloradia* of North America. See Figures 1 and 2. It is unfortunate that the specimen collected by the Sperrys, the only specimen to be figured in color by Ferguson (1971), is very atypical in its appearance. Of the fifty specimens we have before us, only one approaches it in appearance.

### **Coloradia velda** Johnson and Walter **species novum**

**Male:** Thorax and abdomen robust. Dorsum of the thorax with dense, long, white-tipped, black hair-like setae. First abdominal segment white, second commonly black, remaining segments with white-tipped long setae, forming a fringe on the lower sides. **UPF:** Scaling more dense than in *doris* and *luskii*, resulting in greater opacity of the wings. Majority of *velda* males have markings bright, contrasting, and well-defined. Basal area with conspicuous tuft of long, bright pink setae at proximal ends of anal veins. In many specimens pink setae and scales are scattered along the fringe of the anal margin to the anal angle where an evident pink edge is developed. Antemedial line strong, black, edged on the distal side with white, the white forming a conspicuous patch at the costal margin, the line with a prominent tooth projecting into the cell. Discal spot roundish to square, black, with a few white scales usually present at the center, the spot about equidistant from the ante- and postmedial lines. Postmedial line strong, black, toothed at the veins, and accented with white on the proximal edge. Median and submarginal areas peppered with white scales. Submarginal area variable in the development of the markings. In most specimens at the apical angle three black lunules are present between the branches of the radius, accented distally by white scaling that continues down the submarginal area in a sinuous, interrupted line or band to the anal angle, the line being toothed at the veins. Fringes at the outer margin are black with points of white scales at vein ends. **UPH:** Scaling heavy, reducing translucence of the wings. Wing patterns strongly marked. From the base to the discal spot wing is clothed by long bright pink setae and scales, continuing along the second anal vein and anal margin to the anal angle, forming a rich, copious pink fringe on the wing margin. Discal spot a narrow black bar. Distad of discal spot outer wing well-scaled in black, crossed by a curving band of pale pink midway between discal spot and outer margin, extending from costal to anal margins. Distad of the pale pink band the submarginal area dusted with pale pink scales between veins. Fringes of the outer margin black with points of pale pink

scales at the vein ends. UNF: Basal area and costal margin strongly pink, the median area shading into black caudad of the solid black discal spot. Postmedial black band strong, margined on distal edge by a pink band. Three black lunules between radial veins at apex, submarginal area black, dusted with pink scales. UNH: Based of discal spot and along second anal vein and anal margin pink, paler than UPS. Costal margin white to pink scaled from base to intersection with postmedial band. Discal spot black. Wing distad from discal spot black-scaled to outer margin, black scaling forming a well-defined postmedial band continuous with that of the primaries and originating at the costa from a somewhat rectangular spot of dense black scaling. Postmedial band bounded on distal edge by a band of pale pink. Wing surface along the outer margin dusted with pink scales.

**Female:** Larger than the male; *C. velda* females more robust than those of *C. doris* and *C. luski*. In coloration *C. velda* females resemble males. UPF heavily scaled and opaque, the patterns varying in intensity and contrast in different individuals. Discal spots of the FW tend to be smaller and solid black in the females. The resemblances between sexes hold for both UPS and UNS. UPH much like males, well-scaled and opaque. UPS pink from base to or beyond discal spot and along the second anal vein and anal margin. Discal spot is larger than in the male, oval and black. Postmedial black well-developed from the costal to anal margins, bordered distally by a pale pink band. Wing surface along the outer margin black, dusted with pale pink scales between the veins. UNH much as the male, but with black costal margins.

Wing Expanse: Males -- 25.5-32.5 mm, mean 28.1. N = 28, holotype 30.0. Females -- 32.0-39.0 mm, mean 34.8, N = 20 allotype 37.0.

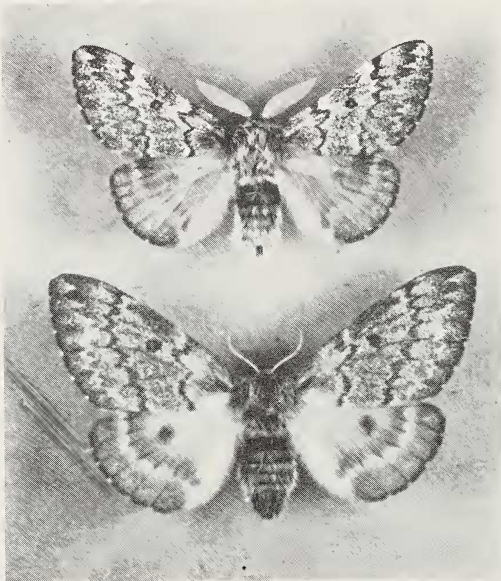


Figure 1. Types of *Coloradia velda*. Upper specimen, holotype male. Lower specimen, allotype female.

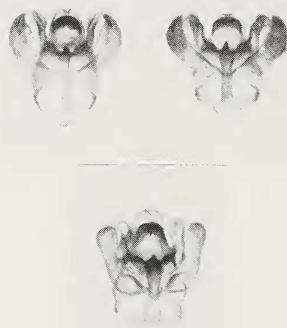
## Types

*Holotype*. male. California, San Bernardino County, Coxie Meadow, 1700 M. 1 VII 1972 at UV light, E. and V. Walters. *Allotype*. as male except 15 VI 1972. *Paratypes*. All California, San Bernardino Co. at UV light. Coxie Meadow; 1700 M.; 2 ♀, 2 ♂, 1 VII 1965 (Kenneth Denton); 1 ♀, 2 ♂, 1 VII 1965 (E. Walters), 4 ♀, 2 ♂, 25 VI 1970 (J. W. Johnson); 3 ♀, 1 ♂, 25 VI 1970 (W. Walters); 2 ♀, 1 ♂, 6 VI 1972 (E. Walters); 1 ♀, 2 ♂, 15 VI 1972 (E. Walters); 4 ♀, 5 ♂, 14 VI 1974 (E. Walters); 1 ♀, 19 VI 1974; 5 ♀, 5 ♂, 6 VI 1975 (J. W. Johnson); 4 ♀, 6 VI 1975 (E. Walters); 1 ♀, 19 V 1976 (J. W. Johnson). Cactus Flat Hwy. 8 12.8 km north Big Bear, 1800 M., 1 ♂, 15 VI 1974 (Charles Bellamy). Barton Flats Campground, 2000 M., 1 ♀, no date (Robert Velten); 1 ♀, 1 ♂, 6-7 VI 1955 (J. A. Comstock). San Gorgonio Public Camp, Mill Creek, 1646 M., no date (G. R. Noonan), Doble, 2255 M, 6 ♀, 23 IV 1959 (Chris Henne) (these are bred specimens presumably eclosed at a much earlier time of year than would be expected in the natural habitat). Hanna Flats, 2064 M., 1 ♀, 1 IV 1954 (Arnold Menke) eclosed after two years in pupa.

*Type Disposition*: Holotype will remain in the collection of Walter, but pledged to Los Angeles County Museum of Natural History (LACMNH) with an unspecified number of paratypes. Allotype and remained to paratypes to remain in the Walter Collection. J. W. Johnson paratypes, one pair each to the LACMNH and the USNM, remainder in the Johnson Collection. The Denton paratypes to remain in the Denton Collection, University of California at Irvine. The Bellamy and Velten paratypes in the collection of Lawrence Shaw. Remainder in the LACMNH collection.

## Discussion

*Coloradia velda* differs from both *C. doris* and *C. luski* in its greater size and robustness, in the wider, more angular primaries, in the greater intensity of scaling reducing the translucency of the wings so evident in the other two species. *C. velda* also has a bright, strongly developed, and contrasting pattern on both primaries and secondaries, differing in this respect not only from *doris* and *luski*, but also from *euphrosyne*. Through the courtesy of Dr. E. E. Sleeper, California State University at Long Beach, and Mr. Lawrence H. Shaw, opportunity was afforded of directly comparing *C. velda* with three male specimens of *C. euphrosyne* collected by Dr. Sleeper July 14 and 15, 1979, in the State of Michoacan, Mexico, 280 kilometers east and 0.8 kilometers south of Morelia. These specimens are strikingly different from *C. velda*. Two of the males were very similar to the description of the type of *C.*



Figures 2-4. Genitalia of three *Coloradia* taxa, ventral view. X 18.

Fig. 2. *Coloradia luski*.

Fig. 3. *Coloradia doris*.

Fig. 4. *Coloradia velda*. Compare the shapes of the valves, penes, transtilla alary processes, and the tergal plates dorsal to the uncus in the three species. The *C. luski* and *C. doris* genitalia prepared by Dr. R. H. T. Mattoni. The *C. velda* genitalia and all micrographs by J. W. Johnson.

*euphrosyne* given by Ferguson (1971, pp 100-101). The third male was lighter in general coloration. The patterns of the primaries of *C. euphrosyne* are indistinct, the antemedial line much like that of *C. luski*, but of low contrast, and the postmedial band close to the discal spot. The secondaries are almost wholly bright pink or red with a large black discal spot and black border. The inferior surfaces were almost wholly red. The *C. velda* was compared with a *Coloradia pandora davis* of the California State University at Long Beach through the courtesy of Dr. Sleeper and Mr. Shaw, the specimen having been taken on Mount San Pedro Martir 320 kilometers south of the California border in Baja California, Mexico. *C. velda* was compared finally with *Coloradia pandora lindseyi* taken by the authors in the San Bernardino Mountains. There is little resemblance between *C. p. davis* and *C. p. lindseyi* and *Coloradia velda*.

Genitalia: in *luski* the penis is long and slender, the valves crescentic and pointed, and the tergal plate covering the uncus exceeding the uncus significantly and strongly emarginate. In *doris* the penis is shorter and wider, the valves crescentic and pointed, and the tergal plate over the uncus scarcely exceeding the uncus and scarcely emarginate. In *velda* the penis is long and wide, the valves narrow and parallel-sided with bulbous rounded ends. In all three species the transtilla has a median black sclerotized spine with alary processes extending laterally and dorsally between the valves and uncus, the shapes of these processes differing in each species. In *C. velda* the transtilla alary processes are very similar to the valves, parallel-sided and rounded and bulbous on the tips. The tergal plate over the uncus well exceeds the uncus and is round and bulbous, much as in *C. euphrosyne*, but differently sculptured. *Coloradia velda* clearly is a distinct species from other known species of the Genus *Coloradia* in North America.

Although *Coloradia velda* has been taken in small numbers in the Jeffrey Pine, *Pinus jeffreyi*, forest of the higher southern reaches of the San Bernardino Mountains, the authors have found the densest populations in the high pure Pinyon Pine, *Pinus monophylla*, woodlands of the northern areas of the range. The authors have not recovered young stages from pinyon pine, but the occurrence of the species in woodland remote from other pine species suggests that pinyon pine may be the preferred food plant. At other sites where it has been taken pinyon pine can be shown to be present scattered through the forest of other coniferous species. The emergence of *Coloradia velda* peaks in June.

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